of Scifres et al. (United States Patent No. 4,820,010). The Examiner also rejected Claims 7 and 14 under 35 U.S.C. §103(a) as being unpatentable over Head et al. in view of Scifres et al. and Rope et al. (United States Patent No. 6,252,715).

The present invention is directed to a method and apparatus for *coupling* a multimode laser to a multimode fiber using a multimode tapered structure. The disclosed multimode tapered structure accepts an optical beam having a highly elliptical beam shape and converts the optical beam for acceptance by the circular multimode optical fiber. The multimode tapered structure has a tapered form having an elliptical cross section at one end to match the rectangular laser aperture, and a circular cross section at the other end to match the fiber core.

Independent Claims 1, 8, 15 and 16

The Examiner rejected independent claims 1, 8, 15, and 16 under 35 U.S.C. §103(a) as being unpatentable over Head et al. in view of Scifres et al.

Regarding claims 1, 8, 15, and 16, the Examiner asserts that Head et al. shows in Figure l and discloses coupling a multiple emitter laser diode to a multimode optical fiber using a micro lens that has elliptical shape (citing Col 2., lines 54-55) to collimate the output of the laser diode and butt the output to the optical fiber.

Nonetheless, the Examiner apparently recognizes that Head et al. do not disclose coupling the micro lens to a multimode laser and the fiber. The Examiner asserts, however, that Scifres et al. show in Figures 2 and 4 and disclose an optical system having a tapered structure to receive a multiple laser diode, where its input end has an elliptical cross section coupling with the lasers, and the output end has a circular cross section coupling to the fiber (citing F2: 11, 49, 53; F4: 23,33).

Applicants note that the light generated by the emitters 12, 14, 16 of Head et al. travels in *free space* from the emitters 12, 14, 16 to the microlens 26 and then again in *free space* from the microlens 26 to the optical fibers 18, 20, 22. Similarly, the light generated by the laser bar 11 of Scifres et al. travels in *free space* from the laser bar 11 to the fiber optic waveguide 17.

Thus, neither Head et al. or Scifres et al., alone or in combination, disclose a multimode tapered structure for *coupling* a multimode laser to a multimode fiber, comprising: an

input end having an elliptical cross section for *coupling* with said multimode laser; and an output end having a circular cross section for *coupling* with said multimode fiber, as required by independent claim 1 and similarly required by independent claims 8, 15 and 16.

Dependent Claims 2-7 and 9-14

The Examiner rejected dependent Claims 2-6 and 9-13 under 35 U.S.C. §103(a) as being unpatentable over Head et al. in view of Scifres et al. and rejected dependent Claims 7 and 14 under 35 U.S.C. §103(a) as being unpatentable over Head et al. in view of Scifres et al. and Rope et al. Claims 2-7 and 9-14 are dependent on Claims 1 and 8, respectively, and are therefore patentably distinguished over Head et al., Scifres et al. and Rope et al. (alone or in any combination) because of their dependency from amended independent Claims 1 and 8 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

All of the pending claims, i.e., claims 1 through 16, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,

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